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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,850	03/04/2004	Yoo Sam Na	2336-252	5310

7590 07/05/2006

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EXAMINER	
LE, LANA N	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/791,850	NA ET AL.	
	Examiner	Art Unit	
	Lana N. Le	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamato (JP 2002-368,642) in view of Tarusawa et al (US 5,715,525).

Regarding claim 1, Yamato discloses a receiver for down-conversion of a dual band (FM and AM band) which converts a radio frequency (RF) signal of a first or second band into a desired intermediate frequency (IF) signal (via mixers 15I, 15Q), (para. 107), the receiver comprising:

first amplification means (12) for amplifying the first-band RF signal;

second amplification means (42) for amplifying the second-band RF signal;

a voltage controlled oscillator (VCO) (32) for outputting a desired oscillating frequency for the conversion of the first-band RF signal (FM band) into the IF signal;

a divider (59) for dividing the desired oscillating frequency in a predetermined ratio to output a frequency for the conversion of the second-band RF signal (AM band) into the IF signal;

a mixer (15I, 15Q) connected to output terminals of filter 13 and tuner 43, VCO and divider, the mixer (15I, 15Q) mixing the first-band RF signal with an output signal from the VCO or the second-band RF signal with an output signal from the divider to output the IF signal; and

switching means (38) for, when the first-band (FM) RF signal is processed, enabling the first amplification means (42) and transferring the output signal from the VCO directly to the mixer (directly from 32 to switch 38) (para. 108), and,

when the second-band (AM) RF signal is processed, enabling the second amplification means (42) and transferring the output signal from the VCO to the mixer via the divider (para. 109). Yamato does not disclose the second band being lower than the first band and a first filter connected to output terminals of the first and second amplification means, the first filter removing image frequency components from output signals from the first and second amplification means. However, it is well known and notoriously old in the art to receive a second that's lower than the first band and a common filter for both systems as disclosed by Tarusawa et al. Tarusawa et al disclose a dual mode receiver wherein the second band (FDD band) is lower than the first band (TDD band) (col 7, lines 1-8) and a first filter (BPF; fig. 4A) connected to output terminals of the first and second reception means (A1, A2), the first filter (BPF) removing image frequency components from output signals from the first and second reception means (col 7, line 47 – col 8, line 26). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first band higher than the second band and to share a common filter for both the FM and the AM bands

in order to enable the multi-band receiver to be capable of receiving signals in different bands to utilize the same circuitry (i.e. filter, mixer) to simplify and reduce circuit components as suggested by Tarusawa et al.

Regarding claim 2, Yamato and Tarusawa et al disclose the receiver as set forth in claim 1, where Yamato discloses the receiver further comprising a phase locked loop (PLL)/I2C (30) for controlling the switching means (38).

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (US 6,831,957) in view of Hitoshi (JP 09-172,385).

Regarding claim 5, Chen discloses a receiver (fig. 1) for down-conversion of a dual band which converts an RF signal of a first or second band into a desired IF signal, the second band (band III) being lower than the first band (L-band), the receiver comprising:

first amplification means (102) for amplifying the first-band RF signal;

a VCO (120) for outputting a desired oscillating frequency (LO2) for the conversion of the first-band RF signal into the IF signal; a first mixer (110) connected to output terminals of the first amplifier (102) and VCO (118), the first mixer (110) mixing an output signal from the first amplifier with an output signal from the VCO (118) to output the second-band RF signal (band III RF signal);

second amplification means (104) for amplifying the second-band RF signal (band III RF signal);

a second filter (tracking filter VTF) connected to output terminals of the first mixer (110) and second amplification means (104), the second filter (VTF) removing image

frequency components from output signals from the first mixer (110) and second amplification means (104);

a divider (main2 divider) for dividing a desired oscillating frequency in a predetermined ratio to output a frequency for the conversion of the second-band RF signal into the IF signal;

a second mixer (106) connected to output terminals of the second filter (VTF) and divider (main2 divider), the second mixer (106) mixing an output signal from the second filter (VTF) with an output signal from the divider (main2 divider) to output the IF signal. Chen does not disclose a first filter connected to an output terminal of the first amplification means; the first filter removing image frequency components from an output signal from the first amplification means. Yokota et al disclose a first filter (121) connected to an output terminal of first amplification means (111), the first filter (121) removing image frequency components from an output signal from the first amplification means (fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a filter connected to the amplifier's output in order to pass the wanted frequency band. Chen and Yokota do not disclose dividing the desired oscillating frequency and switching means for, when the first-band RF signal is processed, enabling the first amplification means and transferring the output signal from the VCO directly to the first mixer, and, when the second-band RF signal is processed, enabling the second amplification means and transferring the output signal from the VCO to the second mixer via the divider. Hitoshi discloses dividing the desired oscillating frequency (via 31; fig. 1) and switching means (51, 52, 5) for, when the first-

band (TV band) RF signal is processed, enabling the first amplification means (3T) and transferring the output signal from the VCO (21) directly to the first mixer (4), and, when the second-band (FM band) RF signal is processed, enabling the second amplification means (3F) and transferring the output signal from the VCO (21) to the second mixer via the divider (31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the same oscillator or phase locked loop instead of separate PLLs in order to simplify and reduce circuitry components and cost by receiving the 2nd band signal through the application of the same local oscillation circuit for the first band reception by tuning to the desired oscillating frequency respectively as suggested by Hitoshi (abstract).

4. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Hitoshi (JP 09-172,385).

Regarding claim 5, the admitted prior art discloses a receiver (fig. 2) for down-conversion of a dual band which converts an RF signal of a first or second band into a desired IF signal, the second band (band III) being lower than the first band (L-band), the receiver comprising:

first amplification means (203, 204) for amplifying the first-band (L band) RF signal;

a first filter (205) connected to an output terminal of the first amplification means (203, 204); the first filter removing image frequency components from an output signal from the first amplification means (203, 204);

a VCO (207) for outputting a desired oscillating frequency for the conversion of the first-band RF signal into the IF signal; a first mixer (206) connected to output terminals of the first filter (205) and VCO (118), the first mixer (206) mixing an output signal from the first filter (205) with an output signal from the VCO (207) to output the second-band RF signal (band III RF signal);

second amplification means (223) for amplifying the second-band RF signal (band III RF signal);

a second filter (210) connected to output terminals of the first mixer (206) and second amplification means (223), the second filter (210) removing image frequency components from output signals from the first mixer (206) and second amplification means (223);

a second mixer (211) connected to output terminals of the second filter (210), the second mixer (211) mixing an output signal from the second filter (210) with an output signal from the oscillator (212) to output the IF signal. The admitted prior art does not disclose a divider for dividing a desired oscillating frequency in a predetermined ratio to output a frequency for the conversion of the second-band RF signal into the IF signal;

and switching means for, when the first-band RF signal is processed, enabling the first amplification means and transferring the output signal from the VCO directly to the first mixer, and, when the second-band RF signal is processed, enabling the second amplification means and transferring the output signal from the VCO to the second mixer via the divider. Hitoshi discloses a divider (31) for dividing a desired oscillating frequency in a predetermined ratio to output a frequency for the conversion of the

second-band RF signal into the IF signal (fig. 1); and switching means (51, 52, 5) for, when the first-band (TV band) RF signal is processed, enabling the first amplification means (3T) and transferring the output signal from the VCO (21) directly to the first mixer (4), and, when the second-band (FM band) RF signal is processed, enabling the second amplification means (3F) and transferring the output signal from the VCO (21) to the second mixer via the divider (31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the same oscillator or phase locked loop instead of separate PLLs in order to simplify and reduce circuitry components and cost by receiving the 2nd band signal through the application of the same local oscillation circuit for the first band reception by tuning to the desired oscillating frequency respectively as suggested by Hitoshi (abstract).

Regarding claim 6, the admitted prior art and Hitoshi disclose the receiver as set forth in claim 5, wherein Hitoshi discloses the receiver further comprising a PLL/I2C (20) for controlling the switching means (51, 52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the PLL control the switching means in order to control the synthesis of the desired local oscillating frequency for the respective frequency bands.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamato (2002-368,642) in view of Tarusawa et al (US 5,715,525) and further in view of the admitted prior art.

Regarding claim 3, Yamato and Tarusawa et al disclose the receiver as set forth in claim 2, wherein Yamato discloses the PLL/I2C (30) has channel information and

serves to control the VCO (32). Yamato and Tarusawa et al do not disclose the first filter using the same control voltage. The admitted prior art disclose a PLL/I2C (213) control a VCO (212) and a first filter (222, 210) using the same control voltage (background of invention; page 5, lines 11-15; fig. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the PLL control the filter and the VCO with the same voltage in order to mix the filtered signal with the oscillator signal having the same corresponding voltage level so as to output a desired IF signal.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamato (JP 2001-174,197) in view of Tarusawa et al (US 5,715,525) and further in view Manku et al (US 2002/0,047,757).

Regarding claim 4, Yamato and Tarusawa et al disclose the receiver as set forth in claim 1, wherein Yamato discloses the receiver comprising a second filter (16, 48) for channel selection in such a manner that it is connected between an output terminal of the mixer (15I, 15Q) and an output terminal of the receiver (output terminal of 10). Yamato and Tarusawa et al do not disclose the second filter is formed on an integrated circuit (IC) chip. Manku et al disclose a filter for channel selection formed on an integrated circuit (IC) chip (para. 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a filter on an IC in order to integrate bulky external filter on IC elements to reduce circuitry space for compactness.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Hitoshi and further in view of Seong (US 5,200,826).

Regarding claim 7, the admitted prior art and Hitoshi disclose the receiver as set forth in claim 6, wherein the admitted prior art disclose the PLL/I2C (213) has channel information and serves to control the VCO (212), the second filter (210) using the same control voltage. The admitted prior art and Hitoshi do not disclose the PLL/I2C serves to control the first filter. However, it is well known to control a first RF filter with the same voltage as suggested by Seong. Seong discloses the PLL/I2C (1) serves to control the first filter (2) (fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to control a first filter in order to tune the frequency of the oscillator to the carrier frequency of the antenna signal.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Hitoshi and further in view of Manku et al (US 2002/0,047,757).

Regarding claim 8, the admitted prior art and Hitoshi disclose the receiver as set forth in claim 5, wherein the admitted prior art disclose the receiver comprising a third filter (214) in such a manner that it is connected between an output terminal of the second mixer (211) and an output terminal (output at 218) of the receiver (230). The admitted prior art and Hitoshi do not disclose the third external filter is formed on an IC chip. Manku et al disclose a filter for channel selection formed on an IC chip (para. 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a filter on an IC in order to integrate bulky external filter on IC elements to reduce circuitry space for compactness.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N. Le whose telephone number is (571) 272-7891. The examiner can normally be reached on M-F 9:30-18:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lana Le

Lana N. Le
6-20-06
LANA LE
PRIMARY EXAMINER